

REMARKS

Claims 1-4 are rejected under 35 U.S.C. §103 as being unpatentable over Matsumoto (U.S. Patent 5,621,659) in view of Schotz (U.S. Patent 5,491,839).

The Examiner again admits that Matsumoto does not teach muting means but relies on Schotz for that feature of claim 1.

The Disclosure of Schotz. Schotz is directed to sending an audio signal from one of several audio components to an audio output unit, using radio waves sent from a transmitter 4 to a receiver 6 (Fig. 1). There are three channels A, B, and C, and each channel has ten available frequencies, one of which is selected by user at switches 10 and 16.

Schotz discloses sound muting, and states that the muting is of three types and occurs (1) when there is no pilot signal 69 from the transmitter 4; (2) when the signal is not “locked;” or (3) when there are power transients. Schotz also mentions (at col. 30, lines 29-39) three muting controls: pin 10 of circuitry 146 in Fig. 11A; microcontroller 137 in Fig. 11A; and power muting circuitry 190, shown in Fig. 11B.

The first type of muting relates to power transients in the receiver and is done by Schotz' power muting circuitry shown as dashed box 190 in Fig. 11B and described at col. 32, lines 17-27. This mutes the audio outputs when there is a power transient in the receiver due to power being lost or regained. The muting circuitry 190 includes a voltage divider 1030 (just above the dashed-line box 190) which sends a “power mute command 174” to the JFET's 1018A and 1018B, on the right side of Fig. 11B. (“174” appears just above “190” in Fig. 11B.)

This circuitry 190 is unrelated to component selection.

The second type of muting relates to a 25-kHz “pilot signal” which is generated in the transmitter and sent to the receiver. The pilot signal is added on top of the audio signal; because its frequency of 25 kHz is above the range of human hearing, it is inaudible. The receiver mutes whenever the pilot signal is made to disappear by “pilot kill circuitry 38” (shown in the middle of Fig. 2A). A pilot kill signal results when the unlock detection circuitry 106 determines that any synthesizer 86 (one for each of the three channels) is unlocked (col. 7, lines 56-63). A pilot kill

signal also results “under certain circumstances” (col. 8, line 3) including whenever there is a power transient in the receiver (not in the transmitter, as mentioned above). See col. 8, lines 1-6.

In the following text (to col. 8, lines 7-30), Schotz discusses power muting circuitry 112 that “monitors the presence of +15 VDC” (col. 8, line 25) and causes muting when power is lost in the transmitter, using the pilot signal. Thus, Schotz uses the pilot signal to cause muting when power is lost or regained in either the transmitter or the receiver, so as to avoid “thumping” (col. 8, line 7, and Abstract); but Schotz also uses the pilot signal to cause muting when there is no lock.

Therefore, the second type of muting mentioned by Schotz actually comprises a combination of the first type (muting on power transients) and the third type (muting on unlocking).

In Schotz' receiver, signal locking refers to part of the demodulation process, which is performed partly in frequency synthesizer 133 in Fig. 11A. Pin 1 of synthesizer 133 receives a mixing frequency from an oscillator and mixes it with the radio signal, using a phase-locked loop. Schotz states (col. 32, line 45) that the microcontroller 137 is “informed” of the signal lock status by circuit 182 (both are at left in Fig. 11A). Schotz states, “microcontroller 137 will, in response to the unlock condition [from circuit 182], issue a mute command” (col. 32, line 59). However, circuit 182 is coupled only to pin 14 of the microcontroller 137 and to pin 7 of a frequency synthesizer 133, and Schotz discloses that this 7 pin controls the transistor 1044 in circuit 182 (col. 32, line 51), so it must be that synthesizer 133 in Fig. 11A controls muting. Schotz also discloses that the “upstream muting command” 164 comes from pin 7 of synthesizer 133. (Signal 164 is on the middle wire passing from Fig. 11A to Fig. 11B.) At col. 32, lines 45-61, Schotz states that muting results from an unlock condition and that pin 7 of synthesizer 133 controls this muting.

Thus, muting occurs in the receiver when there is no mixing of the radio signal from the transmitter with the signal from a local oscillator, and that this condition is called “unlocking” because the mixing is done via a phase-*locked* loop. In the transmitter, there is an analogous circuit for modulating the radio frequency and the transmitter generates a pilot kill command

when unlock detection circuitry 106 detects and unlocked condition (col. 7, lines 56-62). The unlock detection circuitry 106 appears at right in Fig. 2B; a detail view is in Fig. 7A. This prevents hissing (last sentence of Abstract). The Applicants note that in Figs. 2A-2B, the only inputs to the transmitter pilot kill 38 are from the +15 VDC input at left in Fig. 2A and the microcontroller 90 in Fig. 2B, which receives the only output from the unlock detect 106.

To summarize, Schotz discloses muting on either one of just two conditions: (1) when there is a power transient in either one of the transmitter or the receiver; or (2) when radio transmission is faulty because there is no modulation of the radio carrier by the transmitter (or, no demodulation in the receiver), due to failure of the circuits that modulate or mix the radio frequency with intermediate or lower frequencies, the mixing being done by phase-locked loops (hence “unlocking”).

The Rejection. The Examiner asserts (page 4, paragraph 2) that Schotz' first muting circuitry 150 and second muting circuitry 158 shown in Figs. 11A-11B anticipate the claimed means for muting a selected audio signal when the selected component is not responding. The Applicants respectfully disagree.

The circuitry 158, a dashed-line box on the right of Fig. 11B, is a means for grounding the signal outputs 166A and 166B, while circuitry 150 actually appears at the left in Fig. 10A (not 11A as the rejection states), and shows two transistors 1010A and 1010B that are also seen in Fig. 11B, inside dashed-line box 120 toward the left side. Both 150 and 158 are means for carrying out the muting, but they have nothing to do with *determining* or *deciding* muting.

Schotz discloses that the transmitter 4 (Fig. 1) accepts three audio inputs, and transmits all three audio signal “simultaneously” (col. 4, lines 8, 21, and 32). Each of the three channels is broadcast on a respective frequency determined by the setting of the selector switches 10 and 16 (Table II, cols. 42-43). The figures show the electronics for just one of the three channels, the other channels being “identical” (col. 5, lines 16-18). Each channel has its own transmitter synthesizer 86 and its own pilot signal 69 for muting (col. 6, lines 38-40), and Schotz states that muting results if only one of the three channels lacks a pilot signal (col. 7, lines 56-63).

The Applicants respectfully submit that there will *not* be muting if one or more of the audio sources in Fig. 1 (CD player, tape deck, etc.) is disconnected from the transmitter 4, is not powered, or is sending no signal, because the locking relates **only** to the radio-frequency carrier. In Fig. 2B, the three channels' inputs to the unlock detect 106 are all from radio-frequency oscillators (frequency synthesizer 86 for channel A, which feeds to the voltage-controlled oscillator 82; Schotz uses FM modulation, see col. 6, line 67). The unlock detect 106 is coupled only to the radio-frequency circuits, and is *not* coupled to the audio input to the voltage-controlled oscillator 82, which is from 74 in Fig. 2B. The hissing mentioned by Schotz must arise when there is no *radio* signal sent by the transmitter, and not when there is no *audio* signal (i.e., a radio signal with zero frequency modulation).

As to the receiver, Fig. 3A shows that the microcontroller 137 (as discussed above, this controls muting, see col. 31, line 55) is coupled to the frequency synthesizer 133, which feeds the mixer 132, and also to the multiplex stereo decoder 146, which generates the audio output signal. However, in the more detailed view of Figs. 11A-11B, decoder 146 is missing. As noted above, Schotz mentions (col. 30, lines 29-39) that pin 10 of circuitry 146 in Fig. 11A is a muting control, but no such pin is shown in the drawing.

(It is noted that Schotz' disclosure is confused. Schotz states (col. 30, line 42) that in the main muting control circuit 120 of the receiver, transistor 1002 is controlled by the stereo decoder 146 while the other transistor 1004 is controlled by microcontroller 137. However, the base of 1002 is connected to pin 23 of 137 and also to pin 16 of device 854 at lower left in Fig. 11A, while the base of 1004 is *also* connected to 137, at pin 24.)

Schotz in View of the Rejection. For the reasons discussed above, Schotz' system will not hiss even if the three input devices (1-3 in Fig. 1) are turned off or disconnected; and Schotz' complicated system does the same job as an amplifier with three input channels and three cables to be connected to three audio components (CD player, etc.), where the sound is muted if any one of the three cables develops a fault, or if the amplifier is powered on or off.

Matsumoto teaches a system in which audio components are connected to a central unit using ordinary cables. Applying Schotz to Matsumoto would only lead to replacing those cables with radio links (two of the Schotz systems would be needed, since Matsumoto sends information *to* the audio components also), and muting would be needed in such a combination *only* because Schotz' radio-frequency modulation would be used in the combination (not admitted obvious). With respect, Matsumoto itself has no locking and therefore needs no muting when unlocked. Matsumoto is not concerned with "thumping," and this is shown by the fact that Matsumoto even turns the audio devices on and off via bus commands (col. 8, line 58) but does not provide any means of reducing "thumping."

Thus, there is no motivation toward combination.

A Possible Error. With respect, the Examiner appears to have mistakenly applied two different elements as anticipating the claimed selector means: the switch 10 of Schotz (page 4, line 10), and element 4 of Matsumoto (page 3, line 9), which is most analogous to the three channels A, B, C of Schotz.

Respectfully submitted,

ARMSTRONG, KRATZ, QUINTOS,
HANSON & BROOKS, LLP



Nick Bromer
Registration No. 33,478
(717) 426-1664, voice and fax

Address: Atty. Docket 000672
Armstrong, Kratz, Quintos, Hanson & Brooks, LLP
1725 K Street, NW
Suite 1000
Washington, DC 20006

Tel. No.: Armstrong firm (202) 659-2930, voice; (202) 887-0357, fax
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